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AN ANALYSIS OF OPERATION NEPTUNE: LESSONS FOR TODAY'S
NAVAL LOGISTICS PLANNERS

by

Kevin M. Arnwine
Lieutenant Commander, Supply Corps, U.S. Navy

A paper submitted to the Faculty of the Naval War College
in partial satisfaction of the requirements of the Department
of Joint Military Operations.

The contents of this paper reflect my own personal views
and are not necessarily endorsed by the Naval War College or
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Signature: Kevin M. Arnwine

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Abstract of

AN ANALYSIS OF OPERATION NEPTUNE: LESSONS FOR TODAY'S
NAVAL LOGISTICS PLANNERS

Neptune was the joint and combined operation that served as the opening phase of the Allied invasion of Normandy in 1944. Naval in nature and keyed to a logistical objective, its successes and failures provide lessons that are of value to logistics planners today. A review of Neptune's logistical command structure illustrates the need to establish a logistics organization in theatre as early as possible and to maintain clear lines of authority. A critical analysis of Neptune's plan underscores the role that logistics must play in shaping the operational planning process from its initial stages. Finally, a review of Neptune's plan execution documents the pitfalls of ignoring the essential element of flexibility.

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PREFACE

In the summer of 1944, the World witnessed the most amazing feat in naval logistics history when an armada of more than 4,000 ships and landing craft carried 861,000 troops, 157,000 vehicles and 500,000 tons of supplies across the English Channel in just 25 days.¹ Code named Neptune, this naval amphibious operation is of particular interest to modern logisticians because it was a joint and combined operation that was, by necessity, shaped by logistics issues.

What follows is an analysis of the role that naval logistics played in that effort and key decisions that influenced its outcome. Logistical command and control relationships are examined to underscore the advantages of quickly establishing a clearly defined logistics organization in theatre that can actively participate in the initial planning process. The plan itself is scrutinized to delineate how logistics issues can and should shape the operational planning process. Finally, a comparison is made between Neptune's plan as it was envisioned and as it was executed to emphasize the pitfalls of "overplanning."

The lessons to be derived from a study of Neptune include many of the essential elements of operational art. These elements, while embedded in the doctrine and training of the Army and the Air Force, are often overlooked by Navy logisticians. It is hoped that this analysis will stimulate further research into the intricacies of operational art.

INTRODUCTION

In 1943, Allied shipping production exceeded shipping losses by a four to one margin.² This notable victory in the war against German submarines enabled the Allies to fully bring the combined resources of Great Britain and the United States to bear against the Germans. A campaign, to be known as Overlord, was conceived with a strategic directive to "...enter the continent of Europe and, in conjunction with the other Allied Nations, undertake operations aimed at the heart of Germany and the destruction of her Armed Forces."³ Operation Neptune was to be the pivotal opening phase of this campaign with an operational objective of "...securing a lodgement on the continent of Europe from which further offensive operations could be developed."⁴

Operation Bolero, the buildup of U.S. troops and equipment in Great Britain for the cross-Channel attack, began in early-1942. Logistics played a central role in this endeavor aimed at transporting the fruits of American industrial might to the shores of Great Britain. Neptune was driven by the equally demanding logistics of rapidly landing these resources in the teeth of Hitler's formidable "Atlantic Wall." The following analysis focuses on how these logistics challenges were met. Logistical support for Neptune's afloat forces was greatly simplified by the short ranges and underway times involved and this aspect of the overall logistics picture will be discussed in much less detail.

LOGISTICAL COMMAND AND CONTROL

Planning for a cross-Channel attack began in earnest with the establishment of the Chief of Staff to the Supreme Allied Commander (COSSAC) in April 1943. This combined staff formed the nucleus of what would subsequently become the Supreme Headquarters Allied Expeditionary Force (SHAEF). COSSAC was divided into five branches including a Naval Branch and an Administration and Logistics Branch. The Logistics Branch was divided into independent American and British components, each of which were further split into Army, Navy, and Air subcomponents. This arrangement quickly proved too unwieldy and all parallel British and American staffs were fully integrated in the fall of 1943.⁵

Although U.S. naval officers were stationed in theatre during the early stages of logistical planning, these officers repeatedly frustrated their British counterparts by consulting staff planners in Washington on nearly every decision. The inevitable delays in communication and coordination slowed the planning process and bred considerable friction. On the key issue of shipping availability, for instance, several days were wasted while trying to reconcile Washington's planning estimates with those generated within theatre. Situations such as these gradually disappeared as officials with decision making authority were assigned to England.⁶

In January 1944, COSSAC transitioned to SHAEF and General Dwight Eisenhower was appointed Supreme Allied Commander. In

regard to logistics, SHAEF was responsible for establishing broad policy guidelines and making resource allocation decisions. Admiral Bertram Ramsay was assigned as Allied Naval Commander-in-Chief of the Expeditionary Force (ANCXF) and, as a member of Eisenhower's SHAEF staff, was given the dual responsibility of planning and executing the naval portion of Neptune. His naval assets were divided into two task forces, the Eastern Task Force comprised of British and Canadian forces under British command and the Western Task Force comprised of American forces under U.S. command. For simplicity, each task force was made responsible for its own internal logistics support.

In the early stages of Bolero, Admiral Harold Stark, Commander Naval Forces, Europe, was tasked to provide logistics support for the rapidly expanding U.S. naval presence. Upon considering his request for a much needed boost in manpower, Washington decided instead to establish a new command called Landing Craft and Bases, Europe (LANCRABEU). LANCRABEU fell under the operational control of the Western Task Force Commander, Rear Admiral Alan Kirk, while Admiral Stark maintained administrative control.

LANCRABEU was commissioned in July 1943 and its staff included a Logistics Officer and an Assistant for Logistics from the Navy Supply Corps. By June 1944, it had grown to a total of 105 officers and 684 enlisted men, many of whom were assigned to the theatre's various supply bases or served as

liaison officers on inter-service staffs. Although LANCRABEU served as an effective bridge between the task force and Admiral Stark, a considerable amount of valuable planning time was lost before it was sufficiently manned.⁷

Admiral Ramsay and his staff retained a centralized control of Neptune's operational planning that would relegate LANCRABEU and Admiral Stark to only minor logistics roles after the assault began. This concentration of authority and responsibility was soon fractured though by the creation of special interest committees. The first, an inter-service, combined staff called the Build-up Control Organization (BUCO), was formed to tackle the enormous task of developing a consolidated load plan. A subordinate staff called the Movement Control Organization (MOVCO) was formed to execute BUCO's directives. A second subordinate staff called the Turnaround Control Organization (TURCO) was formed with the goal of minimizing the time ships spent between offloading and returning to port for subsequent reloading.

BUCO's members painstakingly sorted out and prioritized the landing force's needs and developed a detailed plan to marry Army requirements with available shipping. Working under the joint direction of the Army, Air, and Naval commanders, BUCO unfortunately was not blessed with direct command authority from these commanders or from SHAEF. As will be seen later, this proved to be a critical flaw.⁸

Other committees were created to deal with issues such as

ferry and tug control, repair, and salvage. So many were formed in fact that new organizations had to be created to keep track of the activities of the various committees.⁹ Rear Admiral Kirk was so frustrated by this bureaucratic maze that he wrote in his post-Neptune logistics report:

The functions of many committees were not clearly defined, some committees overlapped, some continued to function after their usefulness had expired. Decision [sic] taken at meetings were recorded only in the minutes and frequently were too briefly expressed to provide an entirely satisfactory record of the basis for the action. The result was difficulty in maintaining a satisfactory record and some uncertainty as to the authority of the commitments made.¹⁰

Despite this fragmentation of authority, the pieces were in place to ensure that logistics issues could be adequately addressed.

LOGISTICAL PLANNING

The impact of Bolero on Great Britain was enormous, adding over 1.5 million people to a population of 48 million and requiring the docking of 120-150 ships per month in a country that is smaller than the state of Oregon.¹¹ In view of the constraints associated with operating in an island nation, the efficient selection and development of ports was requisite to Bolero's success. Southern England was chosen as the staging area for the buildup on the strength of its established infrastructure, proximity to U.S. supply routes, and ready availability of undeveloped land. A total of 19 bases were constructed including a central supply distribution

point at Exeter. Built in just four months, Exeter's base cleared an average of 6,000,000 ton-miles of spare parts and other freight each month.¹² Labor was a limiting factor during this development and skilled and unskilled workers were brought from the United States to man the new port facilities.

Planning for Neptune was also driven by logistical concerns during this period. The military objective clearly required a buildup of troops and supplies ashore that would be rapid enough to outpace Germany's ability to deploy its mobile reserve forces. It was estimated that as many as 18 divisions would be landed the first month, 12 the second month, and three to five per month thereafter. Planners anticipated the need to use beaches during the critical early stages of the buildup because experience indicated that Germany would make every attempt to destroy a port before allowing it to fall into Allied hands. Initial plans required the beaches to be used for no more than 90 days, but this estimate rose to 120 and above as additional hazards were considered.

The selection of the Caen region of Northern France as the assault objective reflected these logistics concerns. Lying between the River Oire and the base of the Cotentin Peninsula, Caen offered high capacity beaches that were protected from the wind, relatively weak defenses, and proximity to the deep water port of Cherbourg and other South Brittany ports. American forces were assigned the western flank of the assault area to shorten the sea lines of

communication to their supply bases in Southern England and to facilitate direct resupply from the United States.

The uninterrupted flow of men and material across the beaches was so crucial to the success of Neptune that planners conceived the remarkable idea of towing artificial harbors to France to keep the beaches open even during periods of poor weather. They explored and discarded a number of alternatives including a plan to use huge volumes of compressed air to form wave-calming "bubble breakwaters."¹³ The winning plan called for the construction of two "Mulberry" harbors, each consisting of breakwaters formed by concrete caissons called "Phoenixes" and rows of sunken ships called "Gooseberries", pierheads that would rise and fall with the tides, and flexible floating roadways to connect the pierheads with shore. A formidable task considering that 146 Phoenixes, each 200 feet in length and up to 6,000 tons in weight, would have to be constructed and towed across the Channel. Army Historian Roland Ruppenthal wrote, "While the solution was in sense an obvious one, it was at the same time as unconventional and daring in its conception as any in the annals of military operations."¹⁴ Plans were also made for the capture and restoration of ports, but the details and timing of these plans would ultimately depend on the progress ground forces could make after the invasion commenced.

The importance of fuel to the maneuverability of those ground forces required innovative measures as well. During

the first 21 days of the fighting, POL was to be delivered by jerrycan. Afterwards, bulk fuel would be landed at Port en Bessin, located between the American and British landing areas. Much of the bulk fuel was expected to come by tanker, but another ingenious scheme was developed to augment these shipments. Using technology that was largely untested, the Pipeline Under the Ocean (PLUTO) project required the laying of 14 fuel lines across the entire width of the English Channel. PLUTO was not to be relied upon as the sole source of fuel, but it was hoped that it would eventually free up a portion of the Allies' scarce tanker assets.¹⁵

The naval element of Neptune, as planned by ANCXF, was divided into four phases. Starting with the "prestowed phase" from D-Day (the date of the assault) to D+8, Mechanized Transport (MT) ships, small coastal merchant vessels (coasters), barges, and landing craft were to move preloaded cargo and troops to the beaches as quickly as possible. This would be followed by a "buildup phase" from D+9 to D+21 during which the same mix of vessels would pick up additional loads. A "maintenance movement period" from D+22 to D+41 would make use of commodity-loaded deep draft vessels to augment the buildup and a final "change-over period" from D+42 onward would be handled primarily by deep draft vessels, sailing direct from the United States wherever possible.

Recognizing the inevitable difficulty of operating 4,000 craft in a relatively confined area, ANCXF attempted to

address every possible contingency in the operations plan. It established a strict priority system that dictated the precise order in which troops and supplies were to be loaded and unloaded and each vessel was put on a rigid three-day timetable that was to be repeated until the close of the operation.¹⁶ The final planning product was over 1,000 pages long and three inches thick. Despite Admiral Ramsay's directive that no amendments be added after 12 May 1944, numerous changes continued to be made up to D-Day and tactical units who were finding it difficult to digest the original orders were dazed even further. American commanders, including Rear Admiral Kirk, would have preferred a far more decentralized approach to planning and they were insistent that ANCXF's plan unduly restricted lower tactical echelons. The following weeks would prove them to be correct.¹⁷

PLAN EXECUTION

Bolero's success is evidenced by the more than 1.6 million U.S. troops and 5.9 million tons of cargo that landed in Great Britain between January 1942 and May 1944.¹⁸ Underlying this achievement were difficulties in maintaining a constant and efficient flow of shipping. In mid-1943, there was a period of slack in the shipping schedule caused by the postponement of some large troop movements. The War Shipping Department tried to fill the slack by preshipping the Army's equipment ahead of the troops. This practice was vigorously

resisted because of memories of earlier preshipments that had resulted in hopelessly misplaced equipment that had to be reordered two to three times before showing up.

Despite attempts to smooth out the peaks and valleys in the flow of shipping, 40% of the cargo that was shipped through May 1944 arrived during the final five month period. This late rush swamped Great Britain's ports and vital material that had been delayed in its production was stranded at sea. Roland Ruppenthal wrote that the situation, "...illustrated a very fundamental logistical paradox: the threat that the invasion force might not be equipped in the presence of plenty."¹⁹ To alleviate the problem, Great Britain agreed to temporarily cut its own imports including food and fuel for the civilian population. The United States also began "prestowing" material on ships rather than ashore, an inefficient use of valuable shipping assets that was forced by the circumstances.

The assault on Normandy commenced on 6 June 1944 and Allied landing forces soon came face-to-face with the chaos of war. Omaha Beach was far more heavily defended than intelligence reports had predicted and landing craft that weren't swamped by waves were blown apart by shore batteries. Tugs were overwhelmed by the task of clearing crippled vessels and unloading was slowed down by wreckage on the beach. By the close of D-Day, only 100 of the 2,400 tons of supplies scheduled to be landed for V Corps had reached the shore.²⁰

Although a tenuous beachhead had been established, U.S. forces received only 26.6% of their supplies during the first three days of fighting and large numbers of unloaded ships remained offshore.²¹

Several disturbing practices emerged during this period that added to the confusion. Army personnel who were desperate for certain types of ammunition began to selectively unload ships. By taking only those items that were of immediate need, they turned the ships into "dumps" for their excess supplies.²² Others adamantly stuck to the priority system in the face of all reason and refused to unload urgently needed medical supplies that had been manifested as ship's stores and not as cargo.²³ Still others prevented ships from unloading because they had no manifests. It was later discovered that the manifests had been mailed to the wrong beaches.²⁴ Further compounding these problems were arguments between Army and Navy shore personnel over who should direct the movement of vessels offshore.

The ingenuity of on scene personnel ultimately brought order to the far shore. The beaching of LSTs, though strictly forbidden in the operating orders, was tried with great success. DUKWs, six-wheeled amphibious trucks that were nicknamed "ducks", were used to carry cargo directly from ships to open stretches onshore to compensate for shortages of ferries and trucks. By D+5, unloading priorities were disregarded altogether and ships were unloaded in the order of

their arrival. By D+9, the backlog at the beaches was clear and attention turned to the growing turmoil in Great Britain.

The initial delays in unloading over the beaches coupled with a near total lack of reserve shipping shot ANCXF's delicate three-day timetable to pieces.²⁵ Embarkation ports were quickly overwhelmed by troops and equipment that arrived at prescheduled times. BUCO and MOVCO were unable to regain centralized control over the situation because they did not have the direct command authority needed to make their decisions "stick." Responsibility had been so splintered among various specialized organizations in existence that no single group could take charge. For example, the Army's Embarkation Control Organization (EMBARCO), originally tasked to record the movement of Army units, exceeded its charter and began directing those movements in direct competition with BUCO. Finally, the loading plan was disregarded altogether and troops were jammed onto any vessel that came into port. As a result, troops began to arrive in France haphazardly, often separated from their equipment. Frustrated by the delays, General Eisenhower requested and was granted additional MT ships and landing craft to clear the bottlenecks.²⁶

Optimism grew as the floating piers were first used with success on 16 June 1944 and both Mulberry harbors were near completion. This optimism was dashed, however, when an unforecasted gale struck on D+13. The fierce storm shut down

all shipping for three days and destroyed one Mulberry altogether, thus creating a deficit of 105,000 tons of stores and 20,000 vehicles in the required buildup.²⁷

Fortunately for the Allies, open beaches proved to be far more capable for offloading than originally projected and they were able to make up much of the deficit within the next six weeks. Parts salvaged from the demolished Mulberry were used to complete the second Mulberry which eventually handled 48% of the tonnage landed by the British.²⁸ During this time, several small ports were captured that proved of little use. Cherbourg was captured on 27 June, but was so heavily mined that its performance wouldn't surpass that of the beaches and the Mulberry for several months. By 30 June 1944, Neptune was coming to a close. The foothold that was so crucial to the success of the Overlord campaign had been secured, but it should be noted that during the course of the operation, only 71% of the supplies required by the original plan were landed.²⁹

CONCLUSIONS

COSSAC and SHAEF's integrated lines of command and control ensured unity of effort among a group of diverse, and not necessarily harmonious, major players. Valuable time was lost in establishing that structure, but Neptune's planners were fortunate to have the luxury of a two-year planning window. By focusing on logistics issues from the earliest

planning stages, they selected bases, lines of communication, and military physical objectives that fully complemented one another. Their bold use of new technology such as the Mulberry and PLUTO projects made certain that the objective was accomplished.

The creation of special interest organizations such as BUCO helped focus attention on key logistics issues, but made it difficult for any one organization to maintain centralized control over actual operations. Further, Neptune's naval planners were unrealistic in their belief that they could rigidly dictate every detail down to the tactical level. Their failure to provide for reserve shipping and to allow for flexibility in the timetable rendered their plan useless. A period of unnecessary waste and confusion persisted until lower echelons, who had been left out of the detailed planning process, were able to improvise solutions.

OPERATIONAL LESSONS LEARNED

Although we will probably never see another amphibious landing on the scale of Neptune, there are lessons to be gleaned from its study that are of value today. First, it is imperative that a logistics organization be established within theatre as early as possible to ensure that logistics issues are fully considered from the earliest stages of planning. Joint and combined operations require that this organization have clear lines of command and control and the authority to

make and execute decisions.

Operational logistics should be planned backward from the objective. Resource allocation, theatre organization, and basing decisions should be made with the final military objective in mind. Don't allow logistics to define the amount of an objective that you can "afford" to accomplish. Planning backward from the start will identify shortfalls early enough that they can be resolved at the strategic level if necessary.

The "friction of war" demands that operational logistics plans be simple and flexible. Avoid the temptation to plan down to the tactical level. Set a framework for lower echelons that keeps them focused on the operational objective and provide them with options and reserve assets to respond to unexpected and uncontrollable changes in conditions.

These points appear on the surface to be basic common sense, but they must be consciously and deliberately considered at every step of the logistics planning and execution process. The risk of ignoring them is far too great to do otherwise.

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